In a thin section under the microscope it is seen that each grain of the sand is surrounded by a thin coating of crystalline quartz which fills the small interstices and binds the whole together.

It seems altogether probable that the solutions bearing silica followed the porous layers of sand in the cross bedding, but what determined its deposition through the sand in the shape of an icicle is not so easily understood. It is not impossible, although quite improbable, that wind erosion had anything to do in developing these forms. The stalactites exposed in the mine were not so situated as to be attacked by drifting sand. Their local character is scarcely less difficult to explain satisfactorily than the peculiar forms themselves.

J. S. Diller.

U. S. Geological Survey,
Washington, D. C., February 18th.

SCIENTIFIC BOOKS.

Degeneracy: Its Causes, Signs and Results. By Eugene S. Talbot, M.D., D.D.S. The Contemporary Science Series. London, Walter Scott, Limited; New York, Charles Scribner's Sons. 1898. Illustrated.

The busy reader who has dipped into the works of Morel, Lombroso, Nordau and other writers upon degeneracy, and who has become, perhaps, somewhat confused by conflicting opinions and sweeping applications of this interesting biological doctrine, will receive with delight this calm and dispassionate as well as condensed 'conclusion of the whole matter' (up to date). The plan of the book is good, giving as it does a brief survey of the whole subject from its historical, biological, psychological and pedagogical points of view. The author, too, is well prepared for his task, having a wide dental and medical experience, and, particularly, a most extensive acquaintance with the literature of the subject, especially of that literature which is most valuable here, viz., that of the medical and biological journals. This gives the book a healthy inductive tone. The author spends no time in the discussion of theories of his own or of others. He gives us rather a summary of facts relating to the antecedents and the symptoms of degeneracy in all its forms. Of the eighteen chapters some of the most interesting are the ones on heredity and atavism, consanguineous and neurotic intermarriages, toxic agents, school strain, degeneracy of the brain and degeneracy of mentality and morality. In the chapter on heredity and atavism the summary of the accumulated evidence against Weismannism is rather striking.

In a series of chapters the author discusses the causes of degeneracy. Among these, contagious and infectious diseases, led by tuberculosis, syphilis, typhoid fever, scarlatina, small pox, measles and diphtheria, are the most prolific. Other leading causes are toxic agents, such as tobacco, alcohol, opium, tea and coffee, insufficient or impure food and unfavorable climate, and, finally, school strain among children. The immediate consequence of these agents is nervous exhaustion in the first generation. The offspring of these neurasthenics do not possess the necessary vitality to carry them through the normal process of development. The result in the second generation is arrested development of the nervous centers and degeneracy of bodily structure, exhibited in the form of reversions to primitive types. Very full descriptions of the various stigmata of degeneracy follow. Among them are local reversionary tendencies, such as anomalies of skull, jaws, teeth, ears, etc.; nutritive degeneracy, shown in cancer, gout, goitre, adenoids, plural births and excessive fecundity; sensory degeneracy, such as deaf-mutism and congenital color-blindness; intellectual degeneracy, such as paranoia, hysteria, epilepsy, idiocy and one-sided genius; and ethical degeneracy, such as crime, prostitution, pauperism and inebriety. Degeneracy caused by alcohol is less dangerous to the community than that caused by opium and by various contagions and infections, since, owing to its deteriorating effects upon the reproductive organs, it tends to exterminate itself. This non-survival of the unfit is by no means true of all forms of degeneracy. Healthy atavism, however, is always at work and tends to counteract the immediate results of heredity.

Consanguineous marriages are not in themselves, in perfectly healthy stock, causes of degeneracy, but where degeneracy has begun, such marriages, of course, accelerate its action.

The book closes with a chapter on the prevention and treatment of degeneracy. The author is not an advocate of heroic methods, such as the legal regulation of marriage and other still more certain methods of checking its transmission. He proposes milder means, particularly rational forms of prophylaxis adapted to circumstances and to individuals.

G. T. W. PATRICK.

UNIVERSITY OF IOWA,
IOWA CITY.

A Synonymic Catalogue of the North American Rhopalocera. By HENRY SKINNER. American Entomological Society, December, 1898. Pp. xiv+100.

The catalogue of North American butterflies published by Mr. W. H. Edwards in 1884 listed 612 species from the United States and Canada. The new catalogue, now before us, enumerates 645; the moderate number of additions in about 14 years of great activity among lepidopterists indicates that our butterfly fauna is fairly well known. The additions are in reality somewhat more numerous than the figures cited indicate, owing to the rejection of some of the names of the earlier list; but there is no tendency to 'lumping' exhibited, which is rather surprising in consideration of some of Dr. Skinner's previously expressed views.

The literature is cited very fully, though we notice a few omissions, such as that of Edwards' account of the larva of *Lycæna exilis*. The genera are nearly as in the Edwards catalogue. It is to be regretted that *Pamphila* is still made to include a great number of forms, belonging to numerous genera; but it is certainly true that the best generic arrangement which could be offered at the present time would be largely provisional.

An examination of the catalogue recalls and emphasizes certain interesting features of our butterfly fauna. Certain portions are of tropical origin, while other groups belong to what has been called the holarctic region. In the tropics conditions have been relatively uniform for ages, and in consequence we have a large number of organisms in a condition of considerable stability—in other words, 'good species.'

The writer has found, when working with Coccidæ, that the tropical species are, as a general rule, much more easily separated than those of temperate regions. The same is true, apparently, among the butterflies. Take the Hesperidæ and Lycænidæ, which are so numerous in tropical America. The tropical groups of Hesperidæ, in particular, have largely invaded the United States, and very many species have been catalogued. Now Dr. Skinner himself has told us in another connection that these species are, as a rule, well-defined, though frequently superficially similar. But there is one characteristically holarctic series of Hesperidæ—the series of *Pamphila comma*—and here at once we meet with innumerable local races or weak species, with difficulty to be separated from one another. So in *Lycæna* the holarctic group of *pseudargiolus* and its allies is especially polymorphic. When we come to the typically holarctic genera, such as *Argynnis*, we find a wilderness of plastic forms, which may be called species or varieties according to the taste of the student.

It thus happens that for the evolutionist temperate regions, lately subject to glacial desolation, are in many respects more interesting than the luxuriant tropics. Here, especially, are species in the making; here is Nature's kitchen and the cook at work. In the tropics, on the other hand, we often find more numerous and more finished products, and wonderful adaptations, the origin of which is past our comprehension.* The naturalist in South America might well think species were created as he found them; the naturalist of the northern United States could hardly imagine such a thing, unless convinced on *a priori* grounds.

Yet when changes have occurred in tropical lands we find such phenomena as are common in the north. The snails of the Greater Antilles, islands that have undergone great changes of level in recent geological periods, are almost as confusing as the North American Argynnids. So, it seems, we may in some measure learn the

* For plants compare Dr. E. Warming's interesting paper in the *Botanical Gazette*, January, 1899.